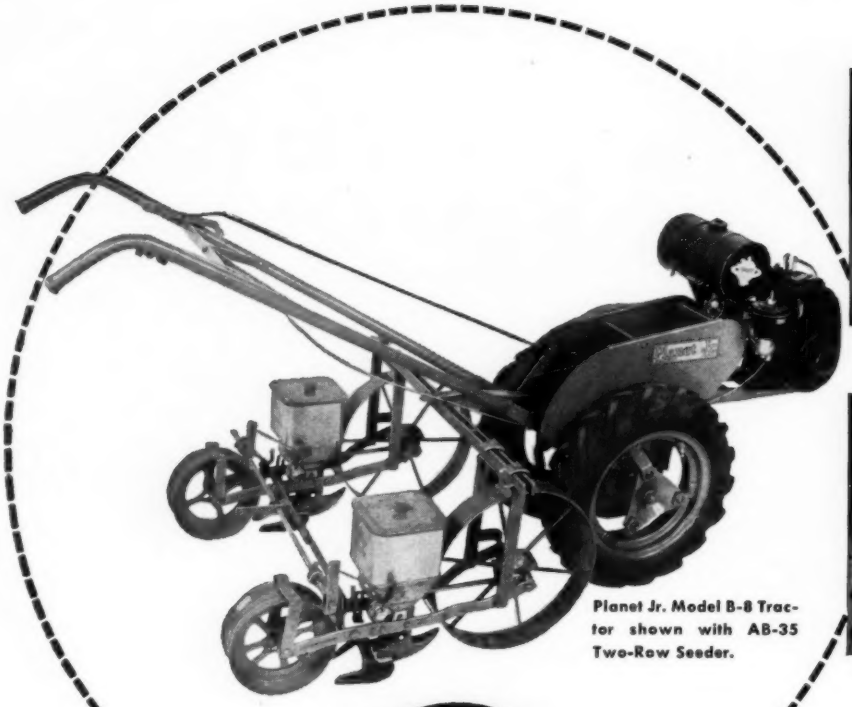
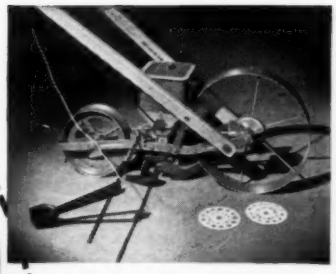
American
JULY • 1953

VEGETABLE GROWER

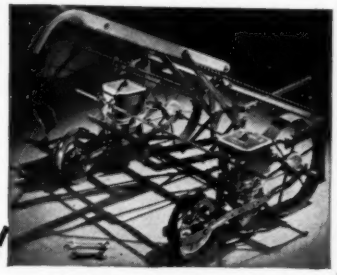
PROGRESS IN PACKAGING VEGETABLES



Planet Jr. Model B-8 Tractor shown with AB-35 Two-Row Seeder.



300A Single Row Hand Seeder



157A 2-row Horse Drawn Seeder

Planet Jr. Seeders for general purpose tractors.

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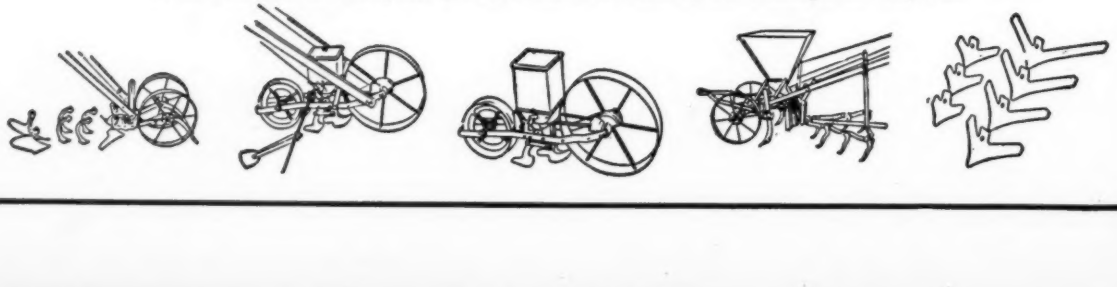

American
VEGETABLE GROWER
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It's true. Actual cost figures kept by one Ohio grower show that the John Bean Potato Harvester saved him almost $100 a day in labor costs alone. With 100 acres of potatoes his total labor savings for the 40-day harvesting season were more than enough to pay for the John Bean Potato Harvester itself. All this in just one season. But dollar savings through reduced labor are not all you get from a John Bean Potato Harvester . . .

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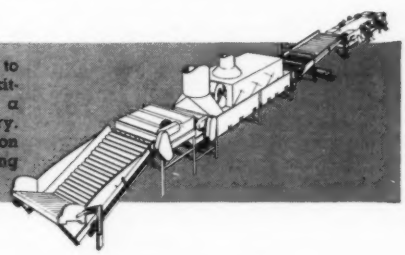
To reduce frost loss, and to market more profitable "kitchen clean" potatoes, use a John Bean Potato Laundry. Send for a free booklet on extra profits from cleaning and drying potatoes.



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LETTERS TO THE EDITOR

Illegal Entry of Wetbacks

Dear Editor:

We have a pretty fine acreage in tomatoes down here on the Mexican border and have been pretty successful through the years. We used to hire Wetbacks from across the border to pick during the harvest, but in the last few years the Wetbacks have started to be a problem.

There are so many of them coming across, now that the growers around here can't hire them all, and they come to us for food. I don't see why the government doesn't do something about keeping them from crossing the border.

I think that growers could do a lot by refusing to hire Wetbacks. If they need to hire Mexicans they should hire only the ones that have been brought into the country legally. The situation has gotten to the point that every grower ought to do his part to help enforce the law.

El Paso, Tex. H. L. Grady

Reader Grady is right about the Wetback problem. A government estimate, which is admittedly low, recently set the number of Mexicans illegally crossing the border at an absolute minimum of 2,092 a day. And through the years these illegal migrants have become bold and often lawless. Ranchers have reported regular raiding of their crops from the Rio Grande in Texas to California.

At present the United States Border Patrol has only 700 men to control this migration, and Willard F. Kelly, assistant commissioner in charge of detention, border patrol and deportation of the U.S. Immigration and Naturalization Service says that at least 900 more men are needed. However, Congress has not provided sufficient funds for this.

To help inspire good citizenship, the Immigration Service is enforcing the McCarran Act, by fining and jailing persons caught "harboring and concealing" illegal aliens.—Ed.

Against Government Handouts

Dear Editor:

I read in your June issue about the Vegetable Growers Association taking its stand against government handouts and subsidies.

I like to see that. It reminds me of the old American way that helped make our country the strong world leader that she is today.

Chicago, Ill. J. J. Barnes

Profit Through Direct Selling

Dear Editor:

In the last three years we have built up a business selling our farm produce directly to city folks, shipping to them by parcel post. By avoiding middlemen, we are able to make more profit, and our customers are happy, too. We send them high-grade produce, often at prices cheaper than they would pay in the stores, and save them shopping time.

I made up a mailing list of names and addresses of my friends and their friends who live in the cities and towns within 75 miles or so of our farm. It is not hard to make up such a list. These folks usually give us the names and addresses of other prospective customers. My lists now contain 500 names, and I keep adding names each year.

In the winter months my customers want canned fruits such as strawberries and red raspberries. In summer one of my most popular items is a bushel hamper, containing several different kinds of vegetables. I try, if I am short of some things, to get my customers just what they want, and this helps to keep them and they get me more customers.

Hammonton, N.J. Mrs. Mary Nicastro

Likes New Publication

Dear Editor:

Enclosed is my $1.00 for a two-year subscription to AMERICAN VEGETABLE GROWER and the Compatibility Chart.

I am pleased to see a magazine of this kind come out as the vegetable field is sparsely covered.

Marysville, Pa. Howard Orris

Articles on Processing

Dear Editor:

If you people have as complete coverage in the field of vegetable growing as you have in the field of fruit growing you should have an outstanding periodical that is conspicuous by the absence of a complete magazine in this field. Most vegetable magazines cover only market growing, and the field of processing is a poor relative. I hope that you have made arrangements to cover processing as you do in AMERICAN FRUIT GROWER so that those growing for processing may benefit from its articles.

Silver Creek, N.Y. Carl F. Shumaker

Helpful Publication

Dear Editor:

Please send me a copy of your magazine. I have a truck farm in Cape May County, New Jersey, and the county agent has suggested to me that your publication would be helpful.

Philadelphia 7, Pa. Earl S. Sparks

We are very happy to send Mr. Sparks a copy of our new publication, and we hope it will prove helpful to him.—Ed.

"Overcoming the Problem of Sprouting"

Dear Editor:

I misplaced my May issue of AMERICAN VEGETABLE GROWER, and I am very much interested in knowing more about the use of chemicals to inhibit sprouting in onions and potatoes. Please let me know where I can find out more about this subject. I am interested in applying the chemical in ways other than were listed.

Great Meadows, N.J. Edward J. Wojcik

We are glad to hear that Reader Wojcik liked the article, "Overcoming the Problem of Sprouting," in our May issue. For more information, contact S. H. Wittwer, Department of Horticulture, Michigan State College, East Lansing, Mich.—Ed.

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IRRIGATION DIVISION

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The VEGETABLE Situation

SUPPLIES of fresh vegetables this summer will be 11% higher than last year, reports the USDA. Because of the larger supply, the price outlook is not bright and lower prices than last year may be expected. Processing crops are about three weeks behind normal but acreages are expected to be as large as last year. Because of large processor stocks, acreages planted to tomatoes and spinach are being reduced, however.

LETTUCE

The only crop for which an important reduction in production for fresh market is expected this summer is lettuce. The summer crop is expected to be 12% below last year and 2% smaller than the 1949-51 average. Reason is the sharp cut in acreage planted in the Salinas-Watsonville district of California. Also below normal temperatures in New Jersey, Connecticut, and Washington decreased yields.

POTATOES

Despite unfavorable weather conditions, production of Irish potatoes is high mainly because of increased acreages planted. In New Jersey, heavy rains caused poor stands in some fields while in Louisiana torrential downpours ruined the harvest and 1,000 acres were abandoned. Sub-freezing temperatures in Nebraska forced growers to cover the plants with soil. In Texas the temperature reached 100 degrees or higher on five successive days.

Production of potatoes for summer harvest is estimated at 16,327,000 bushels, which is 44% larger than last year's unusually small output, but still 25% below the 1942-51 average.

The early spring crop of potatoes made a record high harvest. Over 98% of the crop came from Florida where lower yields than last year were more than offset by a 32% increase in acreage.

The late spring crop is estimated at 47,622,000 bushels, 29% larger than in 1952 and 24% above the 1942-51 average. Seventy per cent of the late spring crop is from California.

Larger supplies and much lower prices than last summer continue in prospect for potatoes.

ONIONS

Some fields in Georgia were not harvested because of market conditions. Reports from Texas are that considerable production was abandoned. High domestic supplies coupled with large imports from Chile and Mexico caused the trouble.

The first forecast for the early summer crop is 2,015,000 sacks, 15% above 1952 and 25% more than the 1949-51 average. The late spring crop is indicated at 6,160,000 sacks, 50% more than last year and 40% above average.

WATERMELONS AND CANTALOUPS

Record acreages of watermelons are reported for harvest in all commercial areas this year. Reports total 428,450 acres for 1953, 19% above last year and 16% above average.

Marked expansion in acreage in Texas is largely responsible for the increased production expected for cantaloups. For spring, early summer, and mid-summer, 13,407,000 crates are expected—9% greater than 1952 and 4% above the 1949-51 average. Considerable acreage of mid-summer cantaloups in the Lower Valley section of Texas were capped to advance harvest dates.

VEGETABLES FOR PROCESSING

About 1.8 million acres were planted to green lima beans, snap beans, canning beets, kraut cabbage, sweet corn, picking cucumbers, green peas, pimientos, winter and spring crop spinach, and tomatoes for processing, according to USDA estimates. This acreage is about the same as last year but 4% less than the average plantings for the 1942-51 average.

OTHER CROPS

Significant increases in summer crop production for fresh market are expected with snap beans, celery, sweet corn, green peppers, and tomatoes as well as cantaloups, watermelons, and onions. With spring crops, increases in production of onions, cabbage, asparagus, lettuce, and tomatoes are important. Decreases in production are most significant for spring crops of carrots, green peas, lima beans, and eggplant.

CAULIFLOWER

Late spring cauliflower production is indicated at 13% more than in 1952 and 2% more than the 1949-51 average. Early spring production at 2,520,000 crates is down, however, over last year mainly because of a decline in production of this crop in California.

MINT

Peppermint acreage is below average whereas spearmint acreage is estimated to be 24% greater than the 3-year average. In Washington, where commercial production started last year, 1,450 acres of spearmint are estimated for 1953.

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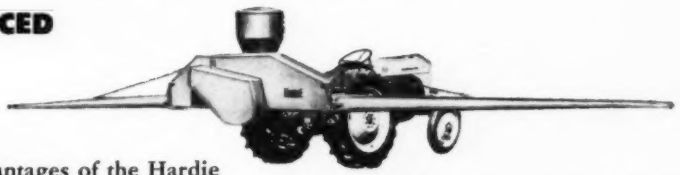

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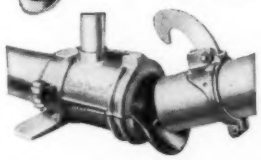

The coupler is the most important part of any Portable Sprinkler Irrigation system. Compare the Rain Control Coupler with any other, and note the many exclusive advantages which save labor, time and trouble.

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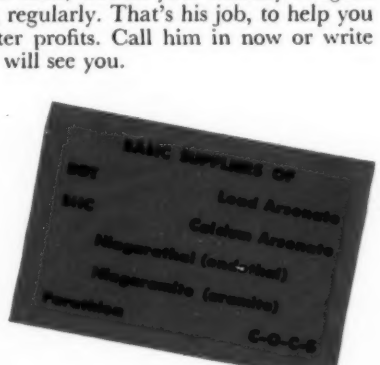

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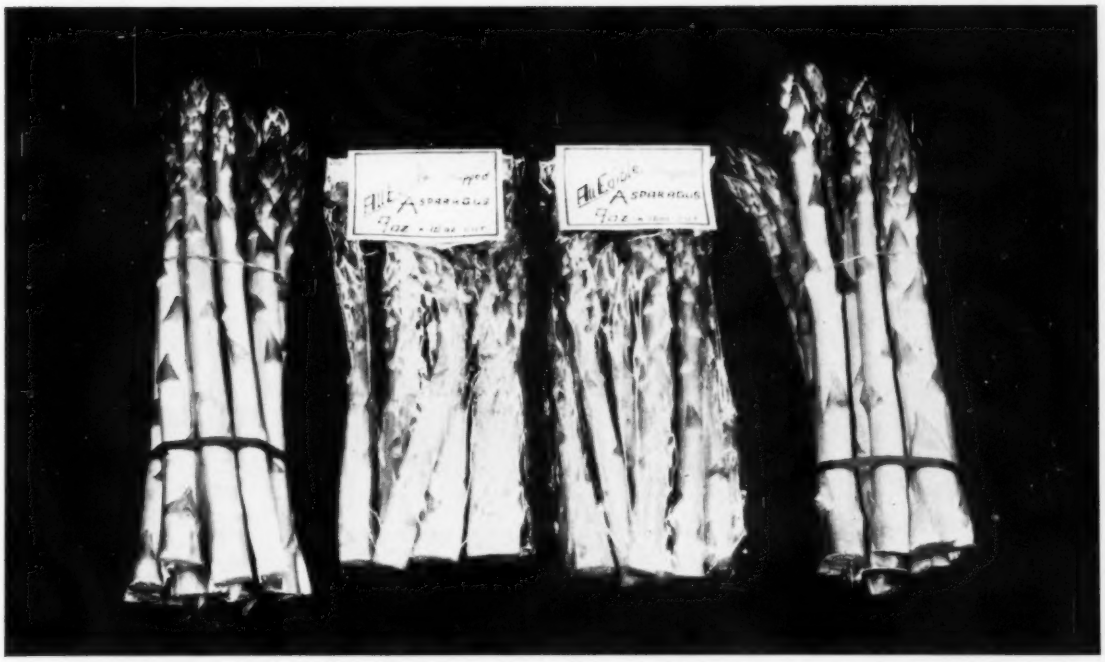


Packaged asparagus spears which represent no loss to the housewife are shown here with "tied" asparagus.

Progress in PACKAGING VEGETABLES

Big business techniques applied to the merchandising of vegetables are resulting in streamlining handling operations and containers and higher quality products for the consumer

By **ROBERT L. CAROLUS**
Michigan State College

TO MEET the higher quality standards now demanded by both retailers and consumers, many changes in bulk and consumer packaging of vegetables have been and are continuing to be evolved. The day of haphazard packaging and marketing of produce is rapidly disappearing. The maintenance of the high volume of sales that has now been reached (40 per cent above prewar) necessitates an ever-increasing vigilance to keep vegetables in "garden fresh" condition until they are sold. A high quality, attractive product has become essential for continued repeat sales.

Improvements in merchandising are being accomplished in many ways. Groups of growers are organizing or being organized by produce men or growers to market large volumes of a uniformly sized, well graded vegetable product. One group of Michigan celery growers has reduced the number of types of crates used by members from 13 to two (standard and four-fifths Howard wirebound) and have set up some of the most rigid sizing and grading standards for their product ever attempted in the East.

Another grower interested in marketing a high quality green wrap tomato has organized over 100 tomato growers in southwestern Michigan and will pack four or five sizes of both "pink" and "green mature" tomatoes at a large centrally located packing house for shipment to southern markets.

A group of asparagus growers, through a local co-op, have marketed over half a million pounds of all green asparagus this spring in one-pound cellophane-wrapped packages. The packaged spears were kept under refrigeration until they were sold at retail.

Cauliflower growers in a western Michigan area have standardized on the western cauliflower crate holding one dozen heads. Forced rhubarb growers in an eastern Michigan area are marketing co-operatively over a million dollars worth of their product annually in 50-pound fiberboard cartons containing 10 attractively printed five-pound packages.

These developments which characterize the increasing interest of growers in more efficient marketing result in a large volume of a well-graded product which attracts large chain store buyers. This helps not only the growers involved but all producers of the crop by widening the area of distribution and thereby maintaining better prices on the local market.

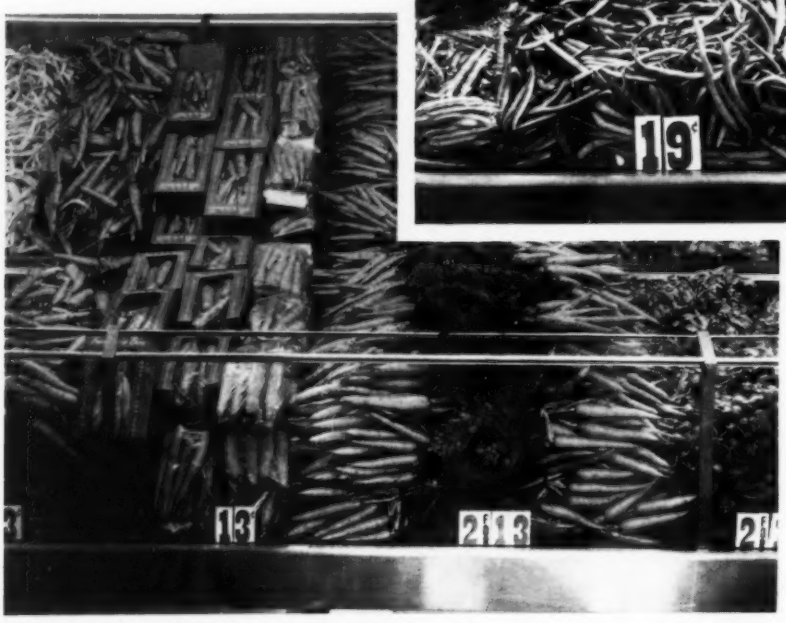
There has been a revolution in

tomato marketing on the Benton Harbor, Mich., market since 1950. In the 1950 season less than 10,000 eight-quart 10-pound fiberboard packages of tomatoes were sold. Due to the fact that tomatoes packed in these containers could be stacked higher and easier in buyer trucks and carried farther with less injury than in the 18-pound splint basket or other packages, buyers clamored for them, until in 1952 over one million packages of tomatoes were sold in this 10-pound box.

Surprisingly, on some markets a better price was frequently received for the 10-pound fiberboard package than for the 18-pound splint basket of tomatoes. This new package helped to move more tomatoes at a better price, in 1952, than had occurred in any previous year.

Other developments in bulk packages are beginning to attract some interest. Quality in sweet corn means sweetness and freedom from worm damage. To maintain sweetness the product must be kept cool, below 45° F. Hydrocooling of mesh- or burlap-bagged corn has been effective in taking field heat out of corn, but for an economical operation at least 1,000 bags of corn should be treated per day.

Retail display of bulk, packaged, and bagged snap beans. Latter sold readily.



Retail display of bunched, packaged, and bagged carrots. Topped carrots in transparent bags, quickly and easily picked up by Mrs. Consumer, appealed most to her.

Buyers have recently looked with favor on a five-dozen-ear triple-walled kraft paper bag of corn. Each package contains approximately 20 pounds of snow or chipped ice. Ice has been maintained in these packages for 15 to 18 hours and the temperature of the corn has been kept below 50° F. Wire closures have been used which allow the melted ice water to be poured out through the neck of the bag at time of delivery.

This triple-walled kraft paper bag has sufficient strength and insulating properties to allow sweet corn to be maintained in excellent condition for a 300- to 500-mile haul in 80° to 90° F. air temperatures. As there are very few products that have a greater repeat sales appeal than fresh sweet corn, this rather simple packaging procedure should do much to increase consumer demand.

Consumer or prepackaging, except for tomatoes, Brussels sprouts, and mushrooms, is almost entirely a post-war development as far as vegetables are concerned. It can be done cheaper at production point than in either the terminal or chain store if sufficient volume is available and the produce is satisfactorily graded and refrigerated. Unless the product is easily bruised, for example tomatoes, there is no advantage in packaging in over-wrapped trays.

Film bags have been found to be very satisfactory for all items. Printed, heat-sealed bags make attractive displays, but plain, unprinted film bags, stapled at the top with the aid of a small cardboard strip describing the produce, have been found to be equally satisfactory.

As most vegetables have a high respiratory rate, it is advisable to use perforated or punched bags of most films to prevent the development of "off" flavors and odors from a reduction of the oxygen content in the bags.

The carrot appears to be particularly well adapted for packaging. Bulk topped carrots have little consumer sales appeal. In a study conducted with a chain store a few years ago the

(*Continued on page 24*)

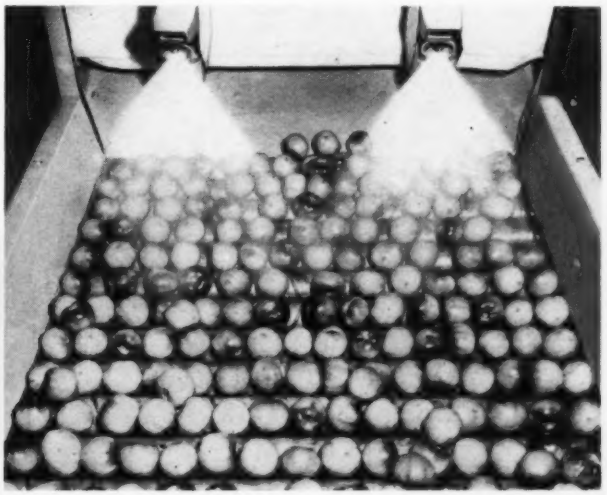
Preserving Eye Appeal with WAX COATINGS

Vegetables retain their fresh, attractive qualities when protected with a coating of wax, weight loss is reduced, and consumer attention is assured

By R. D. GERWE

TODAY, more and more food products are having to sell themselves to the consumer. There has been a great increase in the kind and type of food products, improved and more attractive packages—all competing to attract the housewife's eye. To be sold, a product must first be seen —at its best.

Recognizing this trend more and more packers and shippers have adopted the procedure of washing their produce as well as improving their sizing, grading, and method of packing. For the past quarter century it has been the practice to wash some types of produce such as citrus fruits and apples. Cleaning by dry brushing or washing of other types of produce is comparatively new. This is particularly true of tomatoes, cucumbers, peppers, and especially Irish potatoes and sweet potatoes. Demand for washed potatoes soon forcibly demonstrated the wishes of the consumer. Today virtually all potatoes, including sweet potatoes, are washed, and this is true of most produce.



Above—During operation, interior of wax applicator in tomato packing line looks like this. Left—Potatoes receive a thorough examination by the graders on the potato processing line.

Photos courtesy Florida Div. Food Machinery & Chemical Corp.

Most produce begins to deteriorate just as soon as it reaches maturity or just as soon as it is picked. Since fruits and vegetables are living objects the processes of life continue even after harvesting. Oxygen from the air is taken in and carbon dioxide given off. The carbon dioxide is produced by the breakdown of sugars and thus the sweetness of the fruit or vegetable is diminished.

At the same time moisture is given off in the respiration process and is lost also by exposure of the fruit surface to the atmosphere. This is evident in actual weight loss amounting to as much as four to 10 per cent per week. At the same time the fruit or vegetable becomes soft and shriveled and the color becomes dull.

The speed with which these changes take place is directly dependent upon temperature. The rate of respiration is greatly reduced at lower temperatures, and for this reason it is important that field heat be removed from the fruits and vegetables as quickly as possible after harvesting, and that they be kept cool throughout the marketing channels.

Some years ago it was found that thin coatings of wax materials have the property of retarding those processes which cause deterioration, that the pores are thus partially sealed or restricted, and that the oxygen intake from the atmosphere is thereby diminished and the rate of carbon dioxide given off greatly reduced. Actual measurement showed that the rate of respiration can be reduced advantageously by as much as 50 to 60 per cent.

Citrus fruits were the first type of produce to which a protective wax coating was applied on a commercial scale. This began about 1921 or 1922. Potential benefits which might be derived from an effective coating soon became apparent and by 1937 or '38 virtually all citrus shipped into fresh markets from all of the producing areas in the United States were being so treated.

(*Continued on page* 23)

The author, DR. R. D. GERWE, is director of research of the Florida Division of Food Machinery & Chemical Corp., Lakeland, Fla.

FILMS FOR Prepackaging VEGETABLES

The numerous types available serve definite purposes including sales appeal and adaptability to packaging machines which the grower should consider before selecting a material

By R. E. HARDENBURG
U. S. Department of Agriculture

ONCE a decision is made to prepackage a certain vegetable, the next step is to decide on the type of package and select a packaging material. A good consumer package should slow up the rate of water loss and thus aid in preserving freshness. During marketing it should provide protection against bruising and other mishandling. It should be of suitable size to appeal to average buyers shopping in present-day self-service supermarkets. Today, transparent films are meeting these packaging requirements well. In addition a transparent film bag or overwrap may enhance the appearance of vegetables as well as allow all-around inspection by buyers.

Many transparent films have been developed in recent years to meet some particular packaging problem. They are not all just different types of cellophane as some people assume. Supermarket advertisements may mention "Cello-packed carrots," but today almost all carrots are packaged in polyethylene bags. Films are often classified according to their permeability to water-vapor as non-moistureproof, semi-moistureproof, or moistureproof. Films of the last two types are the useful ones for prepackaging vegetables if weight loss and shriveling are to be reduced during marketing.

A few years ago it was thought that a single film superior to others in maintaining quality would be found for each produce item. Generally this has not been true. In packaging tests several films have usually been equally satisfactory for individual vegetables. The USDA in co-operation with the Western Growers Association in 1952 completed prepackaging experiments on 11 different vegetables in which 27 different films were tested. On the average four different films gave similar keeping quality for each vegetable. In commercial practice a similar situation exists; for example, some spinach prepackers prefer to use a moistureproof cellophane bag while others use a semi-moistureproof cellophane or a cellulose acetate bag.

Choice of a film for prepackaging depends on many qualities besides its effect on wilting, shriveling, and preservation of freshness. Such factors as sales appeal, cost, transparency, resistance to breakage, ease of handling and sealing, and adaptability to available packaging machines should all be considered. Concerning the films suggested herein for vegetables, it should be remembered that other films may be equally worth trial. Some of the vegetables listed have never been widely prepackaged commercially.

Semi - moistureproof Films — LSAT or DSB cellophane and cellulose acetate films are in wide use as produce bags and as overwraps for paperboard trays. Their use is suggested for prepackaging asparagus, spinach, kale and other greens, broccoli, Brussels sprouts, cauliflower, celery, green peas, green onions, snap beans, head and leaf lettuce, salad mix, cole slaw, mushrooms, radishes, rhubarb, and sweet corn. Tomatoes also need a semi-moistureproof film and suggested films are LST or DS cellophane and cellulose acetate.

Various methods of prepackaging celery hearts and Pascal celery are shown in above photograph. The package on the left also contains green onions and radishes.

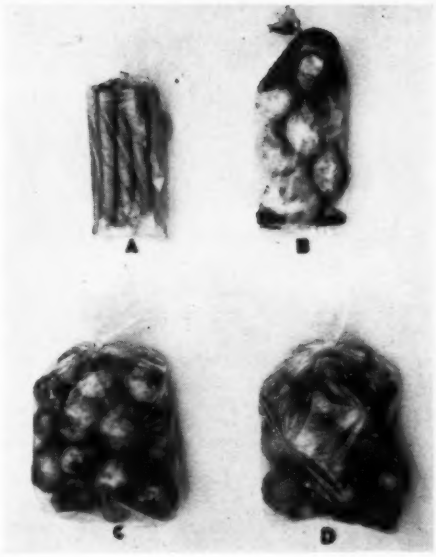
Cellulose acetate, a very clear film and one in which condensation is minimized, allows more moisture loss from vegetables than does semi-moistureproof cellophane. Its use probably should be restricted to produce packaged close to markets or to vegetables in which shrinkage is not the critical factor in deterioration.

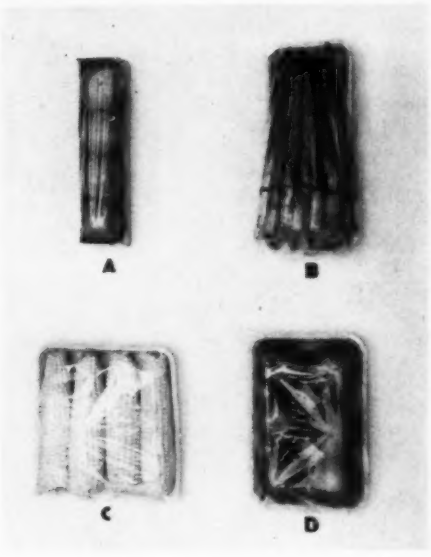
Moistureproof Films—MSAT and MSB cellophane are frequently used for many of the vegetables listed in the preceding section. Moisture loss from vegetables packaged in such film will be negligible but moisture condensation (fogging) and sometimes decay may be

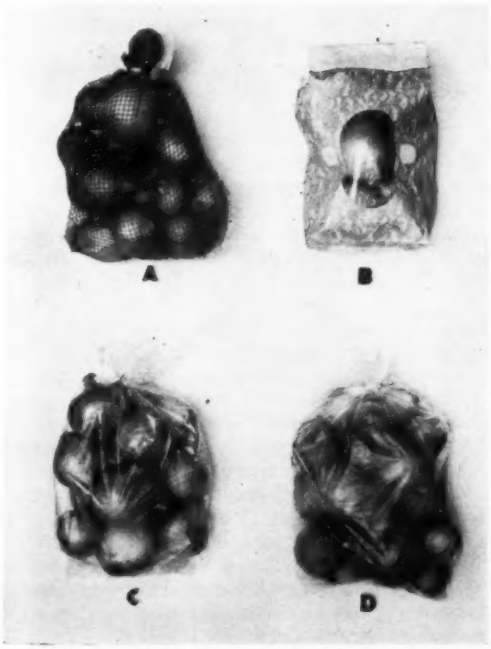
Left—Visibility has been reduced by heavy condensation in tray of snap beans overwrapped with a moistureproof film. A semi-moistureproof film would be much more desirable for snap beans.

slightly higher than in semi-moistureproof cellophane.

Polyethylene and HP Pliofilm are also relatively moistureproof films and in addition are strong, thus they are suitable for bagging heavy produce items such as topped carrots, turnips, parsnips, dry onions, topped beets, potatoes, and sweet potatoes. Potatoes should be prepackaged in transparent bags on only a limited trial scale at first, for kraft and mesh bags are the standard containers for prepackaging this commodity. Greening of potatoes in film bags







Above, left — Polyethylene film bags used for packaging heavy vegetables: A) carrots, B) turnips, C) potatoes, and D) onions.

Above, right — Trays of vegetables overwrapped with semi-moistureproof film: A) standard tray of four tomatoes, B) asparagus, C) sweet corn, D) tray of six tomatoes.

Left—Four types of three-pound consumer bags for onions: A) cotton mesh, B) kraft with window, C) Pliofilm, and D) polyethylene.

ordinarily will not be a problem if retail displays are exposed to light for only two to three days, and reserve stocks are stored in the dark. With sweet potatoes, decay (largely rhizopus rot) has been the main factor holding back prepackaging. Adequate curing and careful handling should reduce decay.

Packages Need Ventilation and Refrigeration — Ventilation of all prepackaged vegetables is important because vegetables remain alive after harvest and need oxygen. Most films do not allow sufficient air exchange at room temperature for even slowly respiring vegetables. Therefore, incomplete bag closures or mechanical perforations are advisable. Four to eight one-quarter or one-eighth-inch holes are suggested for packages holding one and one-half pounds or less. This amount of ventilation will not increase weight loss significantly.

(*Continued on page 25*)

The USED CONTAINER

Is It a Good Idea?

By RUSSEL SWILER
Northern Ohio Food Terminal

AT a terminal market, where more than 60 wholesalers move $100 million worth of produce a year, the casual observer sees the high stacks of bright, clean containers and is likely to overlook the fact that the used container volume in any market, large or small, is a substantial amount.

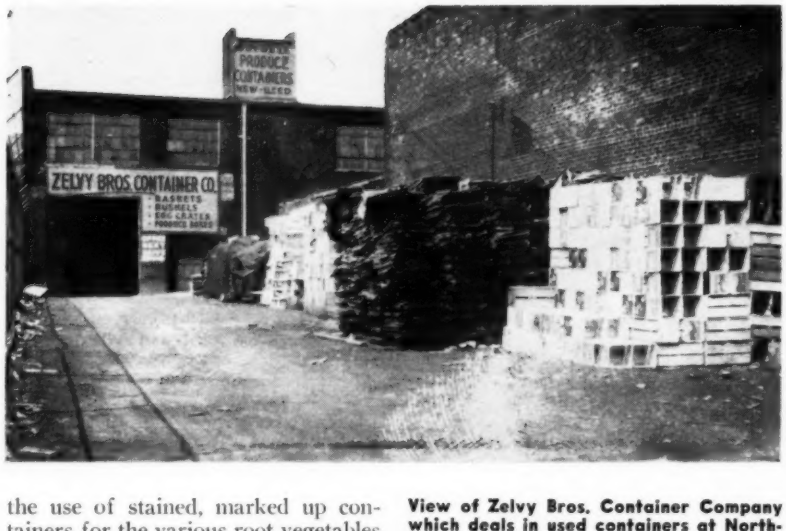
This fact was vividly brought to my attention when I made a store-to-store survey among the wholesalers to get more detatils and facts for this article. As I stepped from the curb I was almost hit by a truck and, ironically, it was a truckload of used strawberry crates moving from a terminal wholesaler out to a berry section.

Of course, that type of load is not unusual, for most berry crates are reused. They make one or more round trips to market each year and reuse probably does not depreciate the selling price of the berries; however, progressive growers with top quality local berries prefer to use new baskets.

Moving on to a potato house, piled high with bright burlap bags from California, Florida, and Arizona, the author was struck by the contrast to the drab picture he sees later when Ohio potatoes are no the market in these same bags, turned inside out to hide the branding and labeling of the original shipper. Certainly the Ohio potato grower is penalizing himself by using these old, unattractive containers.

Interrogating Ohio wholesale vegetable houses that specialize in local produce brings pretty generally the same report: About 25 per cent of our local produce is marketed in used containers. In the minds of most wholesalers this poses the question, "Is the money saved actually saved, or is the price the merchandise brings penalized accordingly?"

All dealers surely recognize that they can not lay down a fast rule. Certainly the cabbage in used bushels or used Bruce boxes is an accepted package on the Cleveland market, but the use of stained, marked up containers for the various root vegetables does raise the question in most salesmen's minds, and probably also with buyers. One intelligent wholesaler asks this question, "Doesn't the farmer have to put two to four more pounds of vegetables in a used container to fill it because it is spread and squashy?"



View of Zelvy Bros. Container Company which deals in used containers at Northern Ohio Food Terminal, Cleveland.

The pendulum on packaging swings both ways. Certainly containers at their current high prices should be reused, and a lot of versatility has been developed by wholesalers and by wholesale vegetable houses in using them. Dealers are daily finding new uses for the tomato lug. This year a new package has appeared on the Cleveland market: 12 coconuts in the Italian garlic box, very popular with retailers.

A good used bushed basket in the terminal market brings 10 cents today and is in demand. Bruce boxes, ever growing in popularity, are a choice find by salvagers and can be sold quickly to many purveyors of other commodities. Most of the California lettuce and vegetable crates find their second use with loads of wrapped meat and other items going on to the trucks of the purveyors to the hotel and restaurant trade.

The salvage, sale, and distribution of used containers is becoming a big and profitable business in large wholesale markets. It fills a vital need always and particularly when shortages develop, as they have this year in peck baskets.

The picture is changing rapidly. The Los Angeles crate, which for years has come to our wholesale markets by the thousands loaded with iceberg lettuce, carrots, cauliflower, broccoli, etc., is becoming a scarce item. With the new vacuum pack method of shipping lettuce in paper cartons dominating in the shipments of that commodity; with the wholesale market receipts of top-iced carrots and other vegetables giving way to the prepackaged, cellophane wrapped; and with lemons beginning to be shipped in cardboard cartons and the possibility of using tubes similar to the tomato tube; besides many banana dealers thinking in terms of the half-box, non-returnable cardboard banana shipping container, the picture gives promise of changing so rapidly that a year from now this article, which proposes to be factual, may be as obsolete as a three-day-old newspaper. THE END

Why the Consumer Buys PREPACKAGED OR BULK Spinach and Tomatoes

A California survey of consumer preference reveals that quality and convenience are major factors and that the former is often lacking by the time the product is offered in the retail market

By JESSIE V. COLES
University of California

GROWERS, packers, and distributors of fresh vegetables need to look to the quality of their products, both prepackaged and bulk, if they are to meet the demands of consumers. Quality of product, ability to choose the quality and quantity desired, and convenience are more important to buyers of vegetables today than the prices they pay.

These are the major conclusions from a study of prepackaged and bulk spinach and tomatoes carried on by the home economics department at the University of California, Berkeley, which took a look at these products from the standpoint of the consumer.

The study included a survey of housewives and a laboratory analysis in which quality and price of bulk and prepackaged products purchased weekly in Berkeley retail stores were compared over a period of a year.

This study as well as observations of these products in stores and packing plants over several years seems to indicate that growers and packers of spinach and tomatoes, especially the packers, need to increase their concern with what happens to their products after they leave the field or the packing plant.

A product which is sound when it leaves the field or plant frequently is an unsound one when it reaches the consumer. Length of time and kind of care in storage as well as overlong periods on the counter undoubtedly give rise to considerable defective product, especially when prepackaged.

Prepackaged and Bulk Spinach—Nearly one-half of the thousand housewives interviewed bought fresh spinach once a month or oftener. These buyers were almost equally divided in their purchases of the bulk and prepackaged. Their reasons for buying each were, however, quite different.

The housewives who bought bulk spinach emphasized quality and ability to choose quality and quantity desired. Those who bought the prepackaged emphasized ease of cleaning and convenience in buying and refrigerating. Three-fourths of the reasons for buying only bulk spinach rested upon the interest of buyers in quality. Ease of cleaning accounted for almost the same proportion of reasons for buying prepackaged spinach only. Over one-tenth of the buyers bought prepackaged spinach because they could not get the bulk.

Packages of Suffolk Farms spinach feature Zip-Tape, the same opening device used on cigarette packages. The Zip-Tape is applied directly to the printed red and white cellophane bags used by Suffolk Farms, Revere, Mass. Zip-Tape and printed bags are made by The Dobeckmun Company, Cleveland, Ohio.

The price of spinach was apparently not important to most of the housewives. Although 70 per cent of those who had an opinion on prices thought that the bulk spinach was cheaper than the prepackaged, only five per cent of all the buyers mentioned price as a reason for buying either the bulk or prepackaged.

The prepackaged spinach cost twice as much as the bulk. Its average price was nearly 31 cents per pound and that of the bulk, with the roots removed, was 16 cents. When waste was considered, prepackaged spinach cost 42 cents per pound and bulk, 20.

(*Continued on page* 25)

In the above photographs sweet corn (left) and celery (right) are shown being packed in wirebound containers on mobile field harvesters. Celery is harvested, washed, graded, and packed on this unit and is then hauled to the packing house to be precooled.

SHIFTS IN PACKAGING Florida Fresh Vegetables

Increased production is being accompanied by revolutionary changes in handling and bulk packaging with emphasis on the wirebound container

By GEORGE M. TALBOTT

Florida Fruit & Vegetable Association

THE rapidly expanding and developing vegetable industry of Florida has shown an increase of over 100 per cent in carlot shipments during the past 10 seasons. In the 1942-43 season Florida shipped only 46,353 vegetable carlot equivalents but by the 1951-52 season this volume had grown to 96,475 carlots shipped. This increase would be even more spectacular if strawberries and watermelons were added to the totals of vegetable shipments, for these two items increased from 3,914 carload equivalents in 1942-43 to 22,284 carloads in the 1951-52 season.

Supplying distant and widespread markets with this ever-increasing quantity of high quality fresh vegetables has been accomplished through continual changes and improvements in the harvesting, handling, and packaging methods for Florida vegetables. Florida shippers have based their produce operations on keeping current with the ever-changing demands of the trade and the consumer and in meeting competition from other producing areas.

Mobile machinery to harvest vegetables in the most rapid and efficient manner has been constructed and put into operation on many of the farms. Special machinery has been designed by the packing houses to insure consistent and uniform package weights, speedy processing of the harvested vegetables, and the proper sealing and closing of the containers.

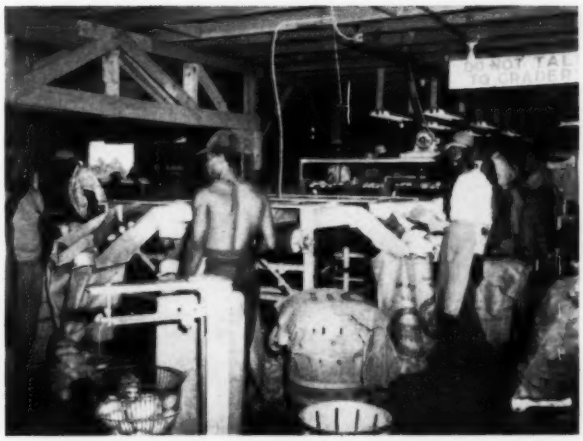
Tremendous thought and research have been conducted to determine the best suitable containers to package the different vegetables so as to insure maximum protection to the shipped vegetables and to assure the best possible arrival appearance and condition. Efforts have been made to use those containers that give the most savings to the shipper through lower packing house operational costs but only when it has meant no sacrificing or curtailing of the supply of high quality farm fresh vegetables for Mrs. Housewife.

One of the more noticeable changes in handling Florida vegetables has been the recent trend to jumble pack tomatoes instead of place wrapping them. The 30-pound lug, container No. 1040, containing individually wrapped and placed tomatoes, was the standard container in Florida for many years. The lug in recent years is being supplemented by various packages carrying a 40- to 60-pound jumbled load.

Three jumble pack containers are in general use in Florida at this time —the 60-pound wirebound crate No. 4015, the 60-pound nailed unitized veneer box No. 1680, and the more recently established two-compartment fiberboard box No. 7007. There is some movement of tomatoes from the state in field boxes but these are minor shipments which are usually trucked directly to tomato repackers.

Another recent container development has been the increased use of the wirebound Universal crate No. 5045 for the shipment of chicory, endive, escarole, cucumbers, eggplants, squash, collards, and peppers which were formerly shipped almost exclusively in hampers and baskets. Fiberboard boxes and one-third-bushel baskets have been used by some cucumber shippers but the majority of cucumbers are shipped in the baskets and the new wirebound crate.

Radishes produced on 3,000 acres in Florida have been shipped mainly



Above—Cabbage being farm packed in 50-pound mesh sacks. The trend is toward movement of this crop in crates. Above, right—Sebago potatoes being packed in 100-pound sacks.

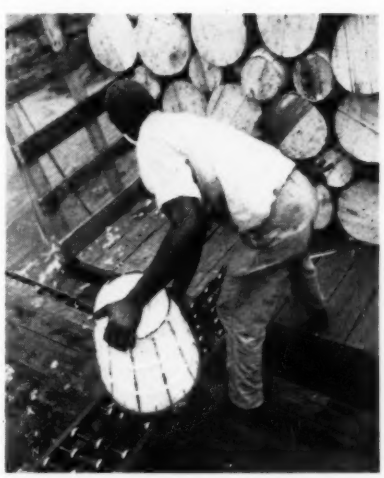
Left—Tomatoes jumble-packed in 60-pound nailed crate. Above—Radishes in 16-quart splint (climax) basket.

in the 16-quart braid splint (climax) basket until the development of an equivalent size wirebound container No. 4126 in the 1952-53 season. Some radish shippers have shown interest in the packaging of topped radishes in polyethylene bags and several are making preparations to ship a limited amount of radishes in this fashion in the 1953-54 season.

The same splint basket used by radish growers has been utilized by Chinese cabbage producers but the wirebound crate No. 3601 usually used for celery obtains the most usage by Chinese cabbage shippers.

The celery container for Florida has changed in the past few seasons from a nailed crate to almost entirely the wirebound crate No. 3601 as the industry has apparently standardized on this container.

Several vegetables which formerly were shipped mainly in mesh sacks are now being moved in crates. One of these vegetables, sweet corn, has been among the most rapidly expanding crops produced in Florida. Sweet corn shipments have increased from 167 carlot equivalents in the 1942-43 season to 7,023 carlots in the 1951-52 season. In the early years of the sweet corn deal the sack was the most popular container but there has been a definite switch to crates during the last few seasons.



Escarole being loaded in bushel hampers.

Cabbage is another crop where some change from sacks to greater movement by crates is taking place. Potatoes continue to be shipped in 100- and 50-pound burlap and cotton sacks. The only new container development has been the use of 50- and 10-pound paper bags for sacking new potatoes which occurred around 10 years ago.

Of all the vegetables being packaged in Florida, snap beans and lima beans for the past 20 years have been consistently shipped in the same one-bushel hamper container. This apparently is an outstanding record and excellent recognition of the design and carrying qualities of this container for these commodities. There have been a few experimental shipments in the 1952-53 season with a new wirebound bean crate, which was constructed with very small spaces between the slats, but it is not known whether or not this crate shall become an established container for beans.

Many different factors and combinations of requirements have entered

(*Continued on page* 23)

Forsythe, USDA

A 10-pound bag of U. S. Grade A potatoes, medium to large size, is the choice of this homemaker.

The Trend In POTATO PACKAGING

The bulk of the top-grade Irish potatoes now go to market with clean faces showing through windowed five-, 10-, and 15-pound bags, making it easy for the consumer to buy

By LARSTON D. FARRAR

THE trend in marketing Irish potatoes for the consumer market is toward prepackaging the spuds in five-pound, 10-pound, and 15-pound bags.

A preponderance of potatoes marketed for the homemaker are packed in paper bags with windows of cellophane, Pliofilm, or other types of covering so that the housewife can examine closely the quality of the potatoes she is buying. Some spuds are sold loose, of course, from bins, trays, or counters, and great amounts also are sold in burlap bags or mesh-type bags made of cotton fibers or paper.

Yet, the trend more and more is toward a small type of paper bag with an aperture, according to USDA experts who have spent a great deal of time both in striving to find the right type of bag for potatoes and in surveying the various trends in this field.

The picture on potato marketings, according to USDA statistics, is as follows:

In 1952 there were 347 million bushels of Irish potatoes produced in the U. S. There were three million bushels imported and 4.5 million exported. Of the total production some 53.5 million did not enter the market —they were consumed on farms by human beings or livestock or used for seed and other purposes. Of the 292.5 million bushels that went to market, 3.5 million were used in starch and flour mills. Some 19 million bushels were sold for seed.

This left 270 million bushels to be used for food purposes. Of this amount 30.5 million bushels were used by processors—for potato chips and such purposes. Some 58.5 million bushels were sent to restaurants.

Virtually all of the potatoes mentioned above—those shipped for export, those sold for seed, and those purchased in bulk—were packed in burlap bags holding from 75 pounds to 150 pounds each.

The vast bulk of the potatoes marketed through channels are U. S. No. 1 grade. There are some 40 million bushels of these, mostly packaged on the farm on which they are grown, at the shipping point, or by wholesalers at terminal points. Some eight or nine million bushels are packaged by retailers.

USDA experts say that in 1952 some 230 million bags to carry 10 pounds of potatoes each were used in prepackaging spuds. A total of 36 million 15-pound bags and 24 million five-pound bags was used.

The biggest trend in packaging is toward paper bags with windows. The potatoes are washed and graded

Forsythe, USDA

Above—Kraft paper bags of 15 pounds capacity being automatically filled.

before being put into the bags. Many wholesalers at terminal markets invest huge sums in machinery to wash, dry, prepare, and package potatoes which they purchase in bulk.

"In the average city the retailers want a dependable supply of potatoes, of good quality," one USDA expert pointed out. "If a bag is marked with a brand name, carries the weight and grade, and can build sufficient marketing prestige, that farmer, supplier, or dealer has a ready market for all the potatoes he can package and distribute."

He pointed out that one prepackaging firm in a large midwestern city has an investment of some $250,000 in packaging machinery alone, not counting the capital funds it must have ready to pay to suppliers and to scores of laborers who work the machinery day in and day out.

This prepackage company's president recently gave this picture of his operations:

"Potatoes are purchased and loaded just as they come in from the fields, which means there is dirt clinging to the potatoes, and much more so if the tubers are dug too soon after a rain. Some cars have as much as 3,000 pounds of dirt to be washed from the potatoes, others less; an average would be about 1,000 pounds of dirt per carload. Much of the dirt settles to the bottom of our tank in the rear of the building, and at least once a week this reservoir is drained and cleaned of mud, vines, etc.

"When packaging 10-pound bags a weight of 10 pounds four ounces net is used to allow for natural weight shrinkage of the potatoes. Other sized bags are packaged accordingly. On a carload of 4,000 ten-pound sacks, this overweight is approximately 1,000 pounds.

"We package the potatoes in five-, 10-, 50-, and 100-pound bags. The five- and 10-pound bags usually are put into a master or baler bag. The following table gives the cost of the various bags used, the prices being on a per-thousand basis, in carload lots, delivered to our warehouse:

Cost of Bags, Per Thousand in Carload Lots

5-lb. paper, mesh, window, printed, two colors	$ 23.45
10-lb. paper, mesh, window, printed, two colors	33.00
10-lb. mesh	66.75
50-lb. paper, printed, two colors	78.70
Masters for 10 lbs., printed, two colors	80.05
Masters for 5 lbs., printed, two colors	85.10
100-lb. burlap bags	164.00

"Our labor cost for packaging potatoes is as follows:

Labor Cost Per Packed Bag

5-lb. in masters	$0.725
10-lb. in masters	.480
50-lb.	.347
100-lb.	.347
3-lb. in masters	1.050

A. Devaney, Inc., N.Y.

Ten-pound mesh bags of potatoes being carried to loading dock on trolley conveyor.

Mrs. Housewife, who has caused this trend toward glorified spuds, unfortunately is not buying as many potatoes as in former years.

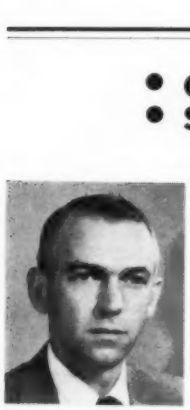
Per capita consumption of potatoes in 1952 in the U.S. was only 96 pounds, continuing a downward spiral begun years ago.

Per capita consumption was 100 pounds per person in 1951, but 130 pounds back in 1940.

People get better potatoes but they don't buy as many of them, according to marketing statistics. THE END

STATE NEWS

- **Care and Housing of Transient Help Receives Attention**
- **Stewart's Disease Wilts New Jersey Sweet Corn**



V. E. Keirns

OHIO—To help expand its program of improvement in cultural and marketing methods, the Ohio Potato Growers Association has hired V. E. Keirns as general manager and secretary. Keirns will work closely with potato growers on production and packaging problems, and with produce buyers on promotion and sales programs, according to President Carroll H. Bartter, Columbia Station. Keirns has served five years as extension specialist in vegetable crops at Ohio State University and has been closely connected with the Ohio vegetable and potato industry.

MICHIGAN — Wind did considerable damage to onions in the Gunn Swamp, Imlay City, Stockbridge, Munith, and Grant areas during June, but part of the areas were replanted and are expected to make a crop.

The care of transient labor is receiving special attention of growers in the Stockbridge area. Baldwin Farms, Lacerne Dixon, and several other growers have arranged for state health department trucks to provide chest X-rays and typhoid and diphtheria shots for all labor. Growers and businessmen of the area are also financing three student ministers to serve in the area for the summer. Duane Baldwin of Baldwin Farms is showing weekly movies for his labor crew.

Stanley Reis of Plainwell has recently joined the vegetable staff of the department of horticulture at Michigan State College. He has recently completed graduate work at Cornell University and will devote much of his time to the weed and pest control problems of Michigan vegetable growers. —*J. W. Rose, Ext. Hort., East Lansing.*

ILLINOIS—Nadeen Fingerhut, daughter of Mr. and Mrs. Harold Fingerhut of East St. Louis, has been selected to be Miss Illinois State Vegetable Queen for 1953. Miss Fingerhut was graduated with honors from Collinsville High School in June.

Miss Fingerhut will compete for national honors with other state queens during the annual convention of the Vegetable Growers Association of America, Inc., in St. Louis, Mo., November 30-December 4. During National Vegetable Week—July 30 to August 8—and during her entire reign she will actively promote the vegetable industry and vegetable consumption.—*Arthur Selme, Sec'y., ISVGA, Rock Falls.*

FLORIDA — The outstanding achievement award of the Florida Seedsmen Association was given recently to Willard M. Fifield, director of the Agricultural Experiment Stations of the University of Florida. The award was presented at the association's 21st annual meeting at Daytona Beach June 13-15.

James Hubert Chamblee, 46, director of the Pioneer Growers Co-operative at Belle Glade, died recently. He was one of the organizers of the former Belle Glade Farmers Co-operative and the Glades Livestock Market. A member of the board of directors of the Florida Fruit and Vegetable Association, Chamblee was also twice president of the Pioneer Grower Co-operative.—*George M. Talbott, FFVA, Orlando.*

WISCONSIN—State potato growers and industry representatives will take their summer tour from Portage County through Waupaca, Langlade, Oneida, and Vilas counties and through the northwest potato areas near Spooner and Rice Lake Monday, July 20, through Thursday, July 23. The tour will be sponsored jointly by the extension service of the College of Agriculture, the Wisconsin Potato Growers Association, and Potato Growers of Wisconsin, Inc.

Wisconsin Muck Farmers Association will take a one-day tour through commercial vegetable production areas of Racine and Kenosha counties Saturday, August 1. The tour will start at 10:00 AM at the Horner Farm in the Wind Lake Marsh, Racine County.—*O. B. Combs, Dept. of Hort., U. of Wis., Madison 6.*

NEW JERSEY — Serious losses from Stewart's disease have been suffered by early sweet corn growers in Burlington County, where 11,000 acres are grown annually. The disease is a form of wilt which usually occurs after a mild winter. The losses in the July crop are estimated at 50 to 60 per cent, according to county agent Daniel L. Kensler.

A 500-acre tract of land near Bordentown has recently been purchased by A. C. Thompson, former president of the Vegetable Growers Association of America. Until recently Thompson was a partner of Congressman Karl King in the King Farm enterprises at Morrisville, Pa.

Four-year terms on the State Board of Agriculture will be served by Charles E. Maier of Pine Brook and Lloyd W. Yeagle of Elmer, who were appointed by Governor

Growers are eager to know in this age of atoms and antibiotics how new discoveries can be applied to the production of vegetables to increase the health and vigor of the American people. With this in mind A. Lee Towson (left) Seabrook, N.J., president of the Vegetable Growers Association of America, and Walter F. Pretzer (standing), VGAA director of organization, recently met at Rutgers University, New Brunswick, N.J., with Dr. Selman A. Waksman, discoverer of streptomycin, and Dr. Robert Starkey of the department of micro-biology, to learn first-hand the latest findings dealing with what is still a mysterious and only partially known story about microbes in the soil.

Alfred E. Driscoll following their nomination at the 1953 Agricultural Convention. Maier operates two farms, one an intensive market garden unit at Pine Brook, and another at a new location at Budd's Lake. Yeagle, representing the South Jersey area, grows almost exclusively for sale to processing plants.—*Fred W. Jackson.*

MISSOURI — Unseasonable heat and drought conditions toward the end of June caused a considerable decrease in the Irish potato yield. Tomatoes suffered a heavier than usual infestation of tomato hornworm and tomato fruit worm.

From two days to six hours—that is the difference mechanization can bring to tomato spraying. It has been achieved by Melvin Shank on his farm at Grandview. He reworked his tomato spray equipment last winter to speed up his spraying operation.—*Clyde R. Cunningham, Ext. Hort., Columbia.*

OREGON—Cold, damp weather and insects in the Willamette Valley have caused much economic damage in connection with the bean and sweet corn crops, according to Dr. W. A. Frazier, Oregon State College horticulturist. Slowdown of production because of losses and replanting may cause a glutting of the canneries when these crops come in, and most of the bean replantings are expected to mature too late to take advantage of student help for picking.

There is an optimistic side to the picture, however, Dr. Frazier says, since some plantings have been thinned by weather and insect damage, and may produce heavier yields than they ordinarily would because of the wider spacing between individual plants.

Fifty furnished units for families and a single men's dormitory will comprise a housing project designed to accommodate at least 250 transient potato harvest workers this fall in west Crook County, according to Dr. H. W. Steelhammer, chairman of the Central Oregon Potato Growers Association.

The project, which will be built at the Redmond Airport, will be financed by funds allotted the association by the Oregon Potato Commission. Family units will rent for $7 a week, and dormitory facilities will be available for 25 cents a night. Local school authorities will co-operate in providing teachers for the children of the labor camp. Classrooms will be provided.—*Robert Birdsall, Ext. Service, Corvallis.*

NEW YORK — A cutworm infestation said to be the worst seen in years recently caused unusually heavy damage to onion, corn, bean, celery, carrot, and other vegetable crops in at least a half dozen counties. Ulster County reported as high as 80 per cent losses to corn plants in some fields. Some replanting of bean crops was necessary in Cayuga County.

One possible cause, according to Rowland W. Leiby of Cornell, was insufficient frost in the ground over the winter to kill the dormant worms.

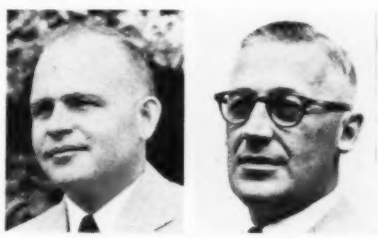
Heptachlor and chlordane, in both liquid spray and dust forms, and toxaphene were used effectively in combating the worms.

CALIFORNIA — Cold weather in the spring delayed most crops and threw the transient labor supply temporarily out of balance. Some areas had more labor than they needed, and much labor moved on to the northern Oregon lumber camps, causing a short supply. In general, family workers were desired for the snap bean and cucumber harvests, and growers in San Luis Obispo and San Joaquin counties tried to provide housing facilities that would help attract more steady labor.

The size of summer vegetable plantings was somewhat modified by the high costs of hand labor this year, according to Harold J. Ryan, Los Angeles County agricultural commissioner. The reduction appeared in plantings of such crops as snap beans, green limas, and others for which picking costs are high.

Carrot growers are jumping onto the advertising wagon in the second major step in the new advertising-promotional program of the Salinas-Watsonville district fresh vegetable shippers. Recently six carrot shippers, who account for 82 per cent of the tonnage moved from California, joined the Lettuce, Inc., group to advertise California bunch and Cello-Pak carrots under the master "C-7" label. The action to bring carrots into the advertising program followed a detailed survey of last year's lettuce advertising program which was found to have been highly successful.

New crosses of tomato varieties are being made possible by use of CPA (chlorophenoxyacetic acid) plant growth regulators, according to Charles A. Rick of the University of California vegetable crops staff at Davis. Rick reports that 80 per cent of the crosses tried last year were effective and that many of these had been impossible by earlier methods. Ways have been found to cross a small-fruited, disease resistant Peruvian variety with regular edible varieties, and experiments show promise.—*F. Hal Higgins.*



E. P. Bugbee, Jr. (left), was recently appointed sales manager of the W. Atlee Burpee Co., Philadelphia, by David Burpee, president of the internationally known seed firm. The promotion of A. R. Junginger (right) to manager of market grower sales was announced at the same time. Both joined the company in 1949.

MONTANA—Work does not stop with retirement for E. E. Isaac, horticulturist for the extension service at Montana State College for the last 27 years. Mr. Isaac retired June 30 and plans to continue in certification work with the Montana Potato Growers Association, an activity which he has done since he began extension work in this state.

VIRGINIA—Eastern Virginia is the oldest commercial truck crop producing area in the U.S., and its favorable climate, soils, and location have placed the counties of Accomack, Northampton, Princess Anne, Norfolk, and Nansemond high among the counties of the U.S. in acreage devoted to vegetables and strawberries. The 1950 Census of Agriculture shows these areas to be leaders of the nation in production although the counties are comparatively small.

Gorman-Rupp pumps assure adequate water for this orchard.

Sufficient water supply for irrigation, as pictured below, results in a larger and better quality crop of potatoes.

GORMAN-RUPP'S "JEEP" Engine Driven IRRIGATION PUMP assures water for larger and better quality FRUIT and VEGETABLES — more verdant PASTURE LANDS, and crops of all kinds.

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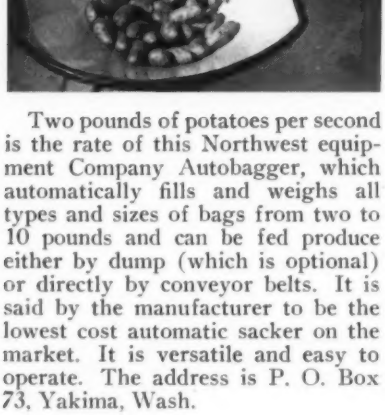
Quick and Easy



Prepackaged vegetable bags can be closed more easily and quickly by using the new Ti-Paks, which were formerly available only for bunching produce. The new product, made by Kimball Company, 307 West Broadway, New York 13, N.Y., cuts labor costs in closing bags and can be used for polyethylene, cellophane, and pliofilm bags. Ti-Paks for bag closures are available in one quarter- and one half-inch widths in three, four, or six-inch lengths.

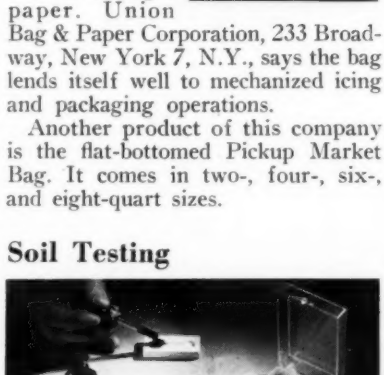
Packaging

Left is the new type of ice bag for packaging sweet corn that was mentioned in Eldon Banta's article, "Keep Sweet Corn Cool and Sweet" in the June issue.

Holding 52 ears of corn and 20 pounds of ice, it is just the thing to keep corn sugars from turning to starch after picking. The bag is made from three layers of wet strength paper. Union Bag & Paper Corporation, 233 Broadway, New York 7, N.Y., says the bag lends itself well to mechanized icing and packaging operations.

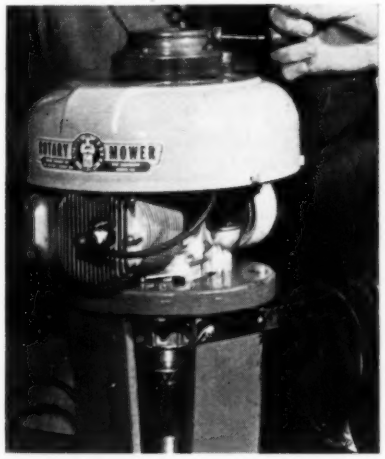
Another product of this company is the flat-bottomed Pickup Market Bag. It comes in two-, four-, six-, and eight-quart sizes.

Soil Testing



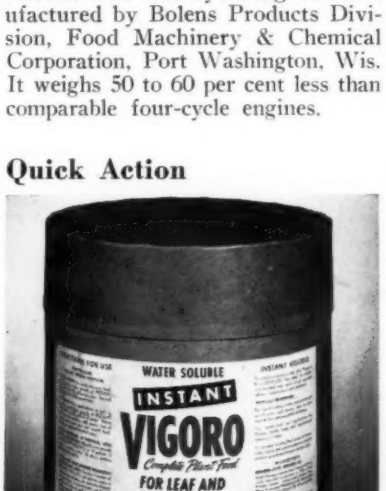
All a vegetable grower need do to test his soil for acid or alkali is to add several drops of indicator liquid from this new Garden Guide soil testing kit to a soil sample in a porcelain plate. He can then compare the resulting color with a handy color chart to get the pH factor of his soil. The kit is manufactured by LaMotte Chemical Products Company, Towson 4, Baltimore, Md.

"Power-Pak"



Less weight and more power are the features of the new two and one-half horsepower, 25-pound Bolens "Power-Pak" two-cycle engine. Manufactured by Bolens Products Division, Food Machinery & Chemical Corporation, Port Washington, Wis. It weighs 50 to 60 per cent less than comparable four-cycle engines.

Quick Action



For quick action in liquid plant feeding, Swift & Company, Chicago 9, Ill., has developed Instant Vigoro. The Instant fertilizer is completely soluble in water and is recommended for either soil or foilage application. It will be packaged in eight-ounce, one-, and three-pound cans, and 25-pound bags.

WAX COATINGS

(Continued from page 11)

The application of a wax coating to rutabagas began about 1936 or '37. This consisted of dipping the rutabaga in melted paraffin which solidifies immediately upon cooling. This method is still being used on this vegetable but it has not been found applicable to any other vegetable or to any fruits.

Wax application of green mature tomatoes on a commercial scale began about 1939. Similar treatment of green peppers and cucumbers soon followed. Wax treatment of sweet potatoes and cantaloupes began a year or so later, and about the same time some shippers began wax treating pecan nuts, employing a pre-scouring step first to furnish a cleaner and smoother surface for the wax.

For the past five or six years carrots, parsnips, bananas, and apples have been wax treated to a minor extent. Treatment of these items has not expanded, probably for a number of reasons. Possibly it is because presently employed operational steps in packing these items do not lend themselves to inclusion of present methods of waxing.

In many instances apples are placed in storage when harvested and are taken out and run over the washing, grading, sizing, and packing line as orders are received. When the temperature of the packing house is higher than that of the apples as removed from storage, there is a tendency for the fruit to sweat. This makes it difficult to apply a wax coating.

Another difficulty lies in the fact that in many cases individual packing operations are relatively small and in such cases the operators feel that expenditure for wax-applying equipment is not justifiable.

Potato Treatments

The treatment of the red varieties of Irish potatoes such as Red Bliss, Pontiak, Dakota Chief, Red McClure, and Red Warbler began about three years ago and is gaining relatively wide acceptance. For this purpose the wax coating preparation contains a U. S. Certified food color closely similar if not identical in shade to the color of the freshly dug potato. Similarly colored wax preparations are now being used on sweet potatoes.

As a result of approximately nine years of research, a new protective coating preparation has been developed for peaches, and last year for the first time peaches were wax treated on a commercial scale. Approximately 100,000 bushels were so treated and the results were outstanding. It is estimated that close to two million bushels will be treated during the present season.

Fruits and vegetables exhibit appreciable variation in their characteristics, in surface structure, in respiration rate, etc., and as a result require different types of wax formulations and also different methods of application.

Effective protective coating preparations, properly applied, do make it possible to resist the efforts of nature to hasten deterioration of fruits and vegetables just as soon as they have reached maximum maturity. They slow down the rate of respiration, reduce weight loss, and retard shriveling and softening. They prolong freshness and make it possible to retain for a longer period the bright fresh color, and they impart an overall attractive appearance which is so essential in gaining the attention of the consumer. THE END

FLORIDA SHIFTS

(Continued from page 17)

into the evolution of the containers used to ship vegetables from Florida. Better protection shown by less bruising, cutting, or mashing of the vegetables, more efficient and effective precooling and ventilation of the produce in the container, and less breakage and bad orders at destination have probably been some of the main reasons in determining the acceptance of a particular container.

The cost and type of labor available to many shippers have placed additional stress on certain important factors such as the simplicity of assembling and packing the package as well as the ease of handling and loading a container into trucks and cars whether they may be a straight or mixed load.

The fact that the container must obtain receiver acceptance cannot be ignored by the shipper. This usually occurs when the package has proven itself by its shipping performance to be the best for a certain vegetable. The receiver may also be influenced by the ease, speed, and economy in unloading, handling, and stacking the container as well as its re-use or re-sale value.

Florida shippers have proven themselves to be openminded and ready to accept container changes and improvements when it can be definitely shown that a better package is available for their use; therefore, even more changes may be expected as Florida continues to be the winter vegetable garden of the nation. THE END

CALENDAR OF COMING MEETINGS & EXHIBITS

July 14—Indiana Vegetable Growers summer meeting, O'Neal Farm, So. of Lafayette, 10:00 A.M. Roscoe Fraser, Ext. Dept., Lafayette.

July 15—Indiana State Tomato Fieldmen's meeting, O'Neal Farm, So. of Lafayette, 10:00 A.M. Roscoe Fraser, Ext. Dept., Lafayette.

July 20-23—Summer tour, Wisconsin potato growers and industry representatives, sponsored jointly by Extension Service of College of Agriculture, Wisconsin Potato Growers' Assn., and Potato Growers of Wisconsin, Inc. Details available from O. B. Combs, Dept. of Hort., U. of Wis., Madison 6.

July 30-31—Annual Potato Field Day, Pennsylvania Co-operative Potato Growers' Assn., Camp Potato Experimental Farm, U.S. Route 6 between Galeton and Coudersport in Potter County.

July 30-Aug. 8—Fifth annual National Vegetable Week. Details available from Dr. H. D. Brown, Sec'y, VGAA, Columbus 10, Ohio.

Aug. 1—Wisconsin Muck Farmers' Assn. summer tour, starting at Horner Farm, Wind Lake Marsh, Racine County, at 10:00 A.M. Details available from O. B. Combs, Dept. of Hort., U. of Wis., Madison 6.

July 30-August 8 are the dates of the 5th National Vegetable Week, sponsored by the Vegetable Growers Association of America to acquaint consumers with the importance of vitamins and energy values in vegetables. Food chains and allied industries will co-operate in making the event a success by publicizing it in their advertising, and the National Broadcasting Company will televise the National Vegetable Week show which will originate from Station WBAL-TV, Baltimore.

Aug. 6—Empire State Potato Club summer field day, Schuler's Farms, Inc., Cato, N. Y. Philip Luke, Chairman, Trade Show Committee, R. 3, Fulton, N. Y.

Aug. 12-14—Ohio Pesticide Institute annual tour. Originates at Ohio Agricultural Experiment Station, Wooster, and ends at Northwest Test Farm, Hoytville. J. D. Wilson, Sec'y, Wooster.

Sept. 23-25—Florida Fruit and Vegetable Association 10th anniversary convention, Casablanca Hotel, Miami Beach. Association headquarters: 4401 East Colonial Drive, Orlando, Fla.

Oct. 4-10—Produce Prepackaging Association 3rd annual conference and exposition, Chase Hotel, St. Louis, Mo. Association headquarters: 1250 East Main St., Stamford, Conn.

Oct. 5-7—Texas Citrus and Vegetable Growers and Shippers convention, Shamrock Hotel, Houston, Texas. Association headquarters: 306 E. Jackson St., Harlingen, Texas.

Oct. 23-24—Annual Potato Festival, Klamath Basin, Ore., sponsored by Merrill Lions Club. Potato queen will be selected.

Nov. 10-12—Western Growers Association annual meeting, Hotel de Coronado, Coronado, Calif. Association headquarters: 606 South Hill, Los Angeles 14. C. B. Moore, Exec. Vice-Pres.

Nov. 30-Dec. 4—Vegetable Growers Association of America annual convention. Chase Hotel, St. Louis, Mo. Convention exhibits and arrangements: Dr. H. D. Brown, VGAA Sec'y, Ohio State University, Columbus 10, Ohio. Publicity: Max Chambers, Preston, Md.

Dec. 6-10—National Junior Vegetable Growers Assn. annual convention, Tulsa, Okla. Write Prof. Grant Snyder, Univ. of Mass., Amherst, for data.

Dec. 10-11—Iowa State Vegetable Growers' Association 40th annual convention, Hotel Hanford, Mason City, Iowa. C. L. Fitch, Sec'y-Treas., Ames.

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WANTED: UNIMPROVED FARM CHEAP. HERBERT AYER, R-1, Newtown, Ohio.

WANTED: USED SMUDGE EQUIPMENT, POTS, ETC. MOUNTAIN VIEW ORCHARDS, Olathe, Colo.

PROGRESS IN PACKAGING

(*Continued from page* 10)

writer found that eight times as many carrots were sold when priced at 19 cents in a two-pound film bag than were sold when priced at five cents a pound in bulk. The same carrots were used in both cases and displayed side by side in refrigerated produce counters.

The green tops of bunched carrots are associated in the mind of the consumer with a fresh product. If the packaged product is of comparable quality, however, it will sell even better because the problem of inedible tops disposal is eliminated. Two years ago less than 15 per cent of the carrots shipped out of the Rio Grande Valley were topped; this year less than 15 per cent were shipped in bunches.

In Michigan many growers are marketing large quantities of topped carrots of Danvers, Nantes, and Imperator types in one-pound or 20-ounce packages. Carrots of less than an inch in diameter and five and one-half to six and one-half inches long are preferred. For best quality they should be stored at temperatures of 32° to 37° F. at 85 to 95 per cent relative humidity. They must be washed perfectly clean in a washer that does not scar them up too badly.

Eastern-grown carrots have been found to be as high in sugar and carotene content as those from western areas, and where they are of comparable size, have been as well received on the market.

Packaging of carrots, parsnips, and turnips has given some Michigan growers the opportunity to keep their help profitably employed from October through January or February. Topped radishes in small film bags will soon replace the bunched item.

Bagging Onions

The packaging of onions in two- to five-pound film bags is developing rapidly. Bagging machines with automatic weighing devices will fill as many as 10 bags per minute. This operation can be done cheaper by the grower than in the local supermarket; and chain store buyers are looking for sources of packaged onions. Prepackaged potatoes are an accepted fact.

Celery packaging in recent years has generally been restricted to the packaging of several small hearts in an attractively printed film bag. There is a growing tendency to consider wrapping the fancier quality large green types in some of the newer polyethylene films to give protection to outer stalks and prevent wilting.

Asparagus growers in northeastern Illinois and southwestern Michigan sent over 1.5 million pounds of fresh-packaged asparagus to midwestern markets this spring. In Illinois the growers packaged the product on their farms in 11x14-inch printed 300 L.S.T. cellophane sheets that are wrapped around one pound of "grass" with butts covered and tips out. Eight- to nine-inch all-green shoots were used. Within two hours after cutting, the packaged spears were placed in refrigeration and the product was kept cold all the way to the consumer.

In Michigan the growers brought their "grass" to a co-op which packaged it in 12-inch squares of L.S.A.T. cellophane using a diaper wrap. Twenty-four one-pound packages were placed in a ventilated fiberboard container, and the product was then refrigerated at 37° F. Packaged asparagus may be held for several days at this temperature with no deterioration in quality.

These operations will help to maintain the demand for canning asparagus in an area where the asparagus acreage has more than doubled in the past 10 years.

In experiments at Michigan State College it was found that packaging asparagus in stapled bags of Pliofilm, produced a tenderizing effect and reduced the crude fiber content of the product. Nine-ounce packages of snapped, all-edible spears were preferred by consumers over the one-pound bunches of cut spears in market tests. THE END

MELON SEPARATOR SAVES 90% DAMAGE

A MELON separator, which may reduce freight damage to watermelons by 90 per cent, has been developed by the National Container Corporation at Jacksonville, Fla. Known as the "Safe-Load Melon Separator," it consists of corrugated kraft paper strips which are placed across the width of the railroad car between the ends of the melons.

Most damage to melons in railroad shipping is caused where the melon ends meet as the melons lie in the car. Now the seven-inch-high strips separate the ends.

Tested recently in a shipment of 850 melons from the W. A. Knowles farm at Jacksonville to Buffalo, N.Y., only seven of the melons arrived bruised, despite having been held on team track for four days en route.

The New York Central Railroad has worked closely with National Container in developing the separator.

PREPACKAGED OR BULK

(*Continued from page* 15)

The bulk spinach was, on the average, better than the prepackaged when they were compared in the laboratory. Here the spinach was classed as sound and defective. The defective was divided into the usable and unusable. The unusable portion or waste in the prepackaged spinach was over 50 per cent higher than in the bulk; that in the former was 27 per cent and in the latter, 18 per cent. Altogether about two-thirds of the prepackaged spinach and over one-half of the bulk was judged defective.

Insect damage, and yellow and wilted leaves were the most common defects in both prepackaged and bulk spinach. Crushed and broken leaves were almost as common.

Prepackaged and Bulk Tomatoes—About 90 per cent of the housewives interviewed bought fresh tomatoes once a month or oftener. Sixty per cent of these buyers purchased bulk tomatoes only and almost 27 per cent bought them more frequently than the prepackaged. Only two per cent bought prepackaged exclusively and seven per cent bought them more frequently than the bulk.

Ability to choose quality and quantity desired accounted for 70 per cent of the reasons for buying only bulk tomatoes and their better quality for almost 25 per cent of the reasons.

In general the housewives were indifferent to prices of tomatoes since nearly 40 per cent of them had no opinion as to the relative price of bulk and prepackaged. Almost two-thirds of those who had opinions thought the bulk was cheaper, but only one-tenth mentioned price as a reason for buying either type.

Preference for bulk tomatoes was also indicated by the fact that 44 per cent of all buyers were willing to pay a premium for bulk tomatoes whereas only two per cent said they would pay a premium for the prepackaged.

The prepackaged tomatoes on the average cost 33 cents per pound as purchased and the bulk 23 cents. When waste was considered, edible prepackaged tomatoes averaged 35 cents and edible bulk, 24 cents per pound.

Although the difference in quality of the prepackaged and bulk tomatoes was small, the advantage was on the side of the bulk. About 74 per cent of the bulk and 68 per cent of the prepackaged tomatoes were sound. About 22 per cent of the former and 27 per cent of the latter were defective but usable.

About four per cent of the bulk and five per cent of the prepackaged tomatoes were considered unusable or waste. The low proportion of waste as compared with that in spinach may be explained by the practice of retailers in breaking a package when one or more tomatoes spoil and selling the remainder as bulk.

What of the Retail Store?—The bulk spinach and tomatoes were better than the prepackaged regardless of type or size of store. The store did not greatly affect the relative quality of either the prepackaged or bulk. Although the differences were small, the average proportions of sound product were slightly higher in the large stores than in the small ones.

THE END

FILMS FOR PREPACKAGING

(*Continued from page* 13)

If the package does not permit air exchange the oxygen in the package is soon used in respiration and fermentation begins. Various harmful compounds, which soon give vegetables off-flavors and off-odors, are produced. Vegetables often look better in non-ventilated packages than in ventilated ones, because discoloration and decay may be reduced and green vegetables may stay green longer. However, these advantages are overbalanced by the adverse effect of smothering on odor and flavor.

More ventilation is needed for packages holding three to 10 pounds, mostly to prevent the humidity from being too high. Three-pound polyethylene or Pliofilm bags need 16 to 32 one-quarter-inch holes to prevent excessive rooting and surface mold of onions. Ten-pound potato bags made from these films should have from 32 to 48 ventilation holes.

Refrigeration is essential for prepackaging operations involving perishable vegetables. To slow the rate of deterioration and extend the marketable life of perishable items, the field heat should be removed promptly by precooling, and after the produce is packaged the packages should be held under refrigeration. Broccoli, for example, has a shelf-life of two to three weeks at 32° F. but of only two or three days at 70°.

Remember that preparing vegetables for prepackaging (trimming, washing, etc.) may cause bruising and make them more perishable than non-packaged vegetables. High humidity within the package may also make conditions more favorable for decay. Refrigeration will retard deterioration caused by respiration, discoloration, decay, and moisture loss.

THE END

Books for Your Home Library

DISEASES OF VEGETABLE CROPS *by John C. Walker.* The book thoroughly covers the diseases of such vegetables as asparagus, beans, celery, onions, etc. Each disease is discussed in regard to symptoms, cycle of development, and methods of control. It contains 629 pages and is well illustrated.....$7.50

VEGETABLE CROPS *by Homer C. Thompson.* An up-to-date book which covers such subjects as plant nutrition, weed control, nutritional value of vegetables, recent advances in handling and marketing vegetables, cultivation, irrigation, and storage. The book contains 611 pages and many illustrations. $6.75

THE TOMATO *by Paul Work.* Here is a practical treatise on the tomato which is for the amateur as well as the large commercial grower. It includes discussions on characteristics; methods of planting; fertilization; cultivation, points about harvesting, packing, storing and marketing; as well as insects and diseases which attack the tomato. This illustrated book contains 136 pages. $2.50

USING COMMERCIAL FERTILIZER *by McVickar.* Here is a book which gives information on what fertilizers should be used and how they should be used for most efficient production. $3.00

GARDEN SOILS *by Arthur B. Beaumont.* This book is written especially for the home gardener. The author has presented soil and plant science in simple language. A glossary of scientific terms can be found at the end of the book for the benefit of those unfamiliar with them. Illustrated, the book contains 280 pages. $4.00

AMERICAN TOMATO YEARBOOK *edited by John W. Carncross.* The new 1953 edition contains much information which is of interest to the tomato grower, dealer, and shipper—all those who are vitally interested in the tomato industry. It contains an up-to-date list of recent references to tomato culture and diseases and pests and their control plus helpful information on prepackaging, use of hormones, and grade requirements for canning and processing. Profusely illustrated, the book contains 40 pages.....$2.00

Books sent postpaid on receipt of check or money order.

AMERICAN VEGETABLE GROWER

Reader Service Department

Willoughby, Ohio

Now Is the Time to Check Yield Records

THE YIELD of a particular crop tells the grower much about its profitableness. The wise grower will be constantly checking the yields of his vegetable crops against those of others situated in different areas. He also will be comparing growing methods, especially as to their relative costs.

When a grower discovers that his yields of a particular vegetable crop are lower than his neighbor's, he begins to check every phase of his cultural program to see if he can come up with an increased yield, and at a profit.

Equally important to him are yields of crops in competitive growing areas. If another area is producing a certain vegetable crop cheaper than he can produce it, it is time for a thorough study and a revamping of production methods. It may mean shifting to other vegetable crops which he can produce more economically than a competing area.

It appears, therefore, that a vegetable grower must constantly have at his fingertips information concerning yields of his crops in every section of the country. It helps him determine the position he will have to take in the marketplace.

Each grower strives for the highest possible yield in each of the crops he grows. In order to accomplish this he must be able to put his finger on each limiting factor, analyze its cause and effect, prescribe a remedy and put it to work. That isn't as simple a task as it may seem. There are many pitfalls and only the best businessmen seem to surmount them and come up year after year with high yields.

Now is the time to be noting limiting factors right in the field, at the peak of growing and harvesting? Is it variety? Water? Fertility? Pest control? Or is it a combination of several things? If these observations aren't made now, the grower doesn't have much information on which to base improved methods next year. He must keep alert to new ways to more profitable yields.

Co-operation Among Vegetable Growers

IN THE horse-and-buggy days many sizable towns had their small carriage factories. Not much capital and equipment were required, and wages and production efficiency were not too high. Today the multi-billion-dollar auto industry utilizes half-million-dollar machines to stamp out entire car bodies at the rate of 50 or more per hour. Mechanization and mass production methods involving large capital outlay are being substituted for tedious hand labor, and in turn labor is enjoying the highest standard of living in history.

The vegetable business in the North and East is still probably more nearly in the horse-and-buggy days than that of any other agricultural enterprise. Vegetable growers are having considerable difficulty justifying the wages that their labor demands. Greater mechanization is apparently the answer, but the capital outlay that is required is frequently not compatible with the size of the individual enterprise in the Northeast.

Forty years ago groups of grain farmers formed "threshing rings" for the purchase of steam engines and threshing machines. Today a few groups of vegetable growers are jointly purchasing or using large-scale planting, fertilizing, irrigating, spraying, harvesting, and packaging machinery and equipment.

Co-operative ownership and use of expensive laborsaving machinery will increase labor efficiency and enable the grower to compete in the labor market. Chemical weed control methods and techniques are rapidly being perfected to a point where joint ownership of suitable equipment would be justified. Spraying rings for insect and disease control also would increase the efficiency of the 20- to 80-acre growers.

Co-operative movement of water for irrigation from lakes, ponds, and deep wells could be easily justified in some areas. Expensive vegetable combines and other harvesting machinery might well be jointly owned for more efficient operation.

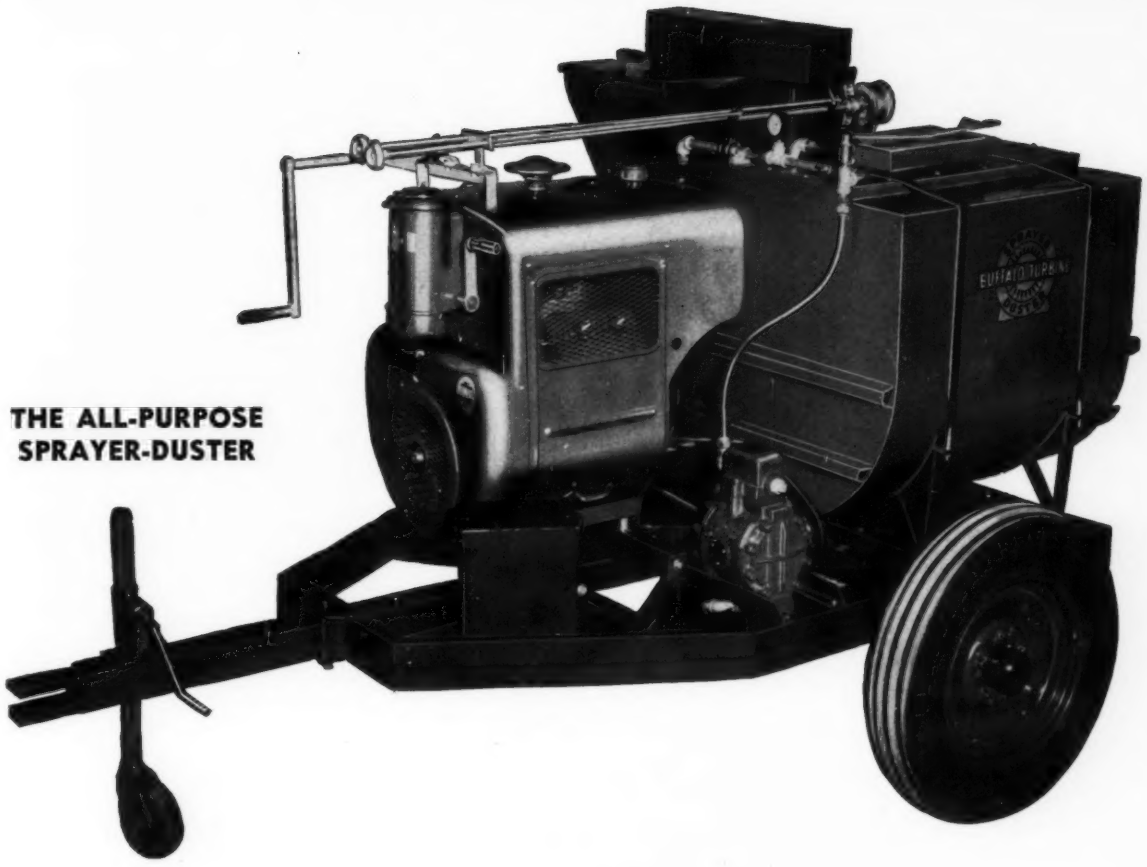
Many groups are co-operating in joint marketing projects. This type of co-operation might well be extended to the growing of a single well-adapted variety. Recently the corner grocery has been replaced by the large supermarket with a million dollar annual volume. Much of our produce is now routed through national, regional, and local chain food stores that in the interest of efficiency of operation and pricing must assemble a considerable volume of any particular produce item, nearly identical in grade and quality, for redistribution to their many retail outlets. The term "homegrown" in the opinion of these large buyers is synonomous many times with a conglomerate of types of packages, grades, and qualities which make streamlined merchandising a nightmare.

Co-operating growers offering a single variety of a uniform grade in an identical package can reach markets that are no longer available to small operators handling a wide variety of a single kind of vegetable. The $10-a-week grocery clerk is no longer around to sort, size, trim, and weigh the produce that reaches the supermarket. Any of these operations, therefore, that can be effectively and efficiently done on the farm will be appreciated and paid for by supermarkets with self service produce departments. Marketing co-operatively through well-managed, efficiently mechanized packing houses appears to be the answer.

Prepackaged Quality

GRANTED that the container is right, the success of prepackaged produce items depends upon quality. Too often tomatoes offered in consumer size packages in the retail market are unripe, marred, or otherwise undergrade. Spinach, as pointed out in an article in this issue, is a great offender, yet packaged spinach is in demand, for what could be more desirable from the standpoint of the busy housewife or the office worker than a quality pound package of clean spinach. No sand—no fuss—no muss!

The consumer wants quality products. Are you supplying what she wants? Is the retailer making sure that only quality produce is further enhanced by glistening transparent wraps?



THE ALL-PURPOSE
SPRAYER-DUSTER

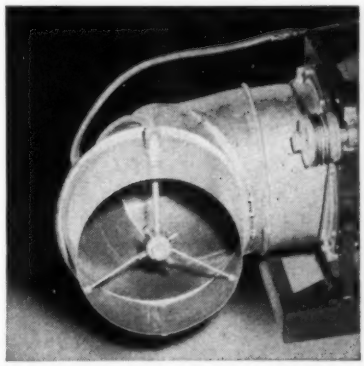
WHY VEGETABLE GROWERS ARE BUYING CONCENTRATE EQUIPMENT

When the idea of developing concentrate spray equipment was first discussed, a number of suggestions were made. These suggestions came from Experiment Stations, chemical companies and growers who were particularly interested in reducing the cost of the annual spray bill. In summarizing the outstanding suggestions, we found that the following items were of extreme importance to the growers:

1. Spraying equipment should be light as possible in order not to unduly pack ground between rows.
2. It should be easily operated by one man.
3. The original cost of the equipment should be reduced substantially.
4. Expensive operation and maintenance should be reduced.
5. The equipment should be constructed to handle concentrate materials which afford greater control and less cost.

The next step was to combine these many suggestions into one piece of machinery which would meet all of the requirements. After a good deal of field testing, this was accomplished in the Buffalo Turbine Concentrate Sprayer. The Buffalo Turbine was the first concentrate sprayer manufactured, and today with many improvements is doing a more than adequate job for hundreds of vegetable grower owners. The Buffalo Turbine, because it is a concentrate sprayer and because it is designed to meet modern vegetable growing conditions, embodies the following important characteristics:

1. 20%-40% less in original cost.
2. Dust Bin being optional makes it possible for growers to dust when necessary.
3. One-man operation.
4. 75% less in weight.
5. 50% less maintenance cost.
6. Can be pulled by the smallest of field tractors.
7. All-steel-plated liquid tank insures long service.
8. All moving parts which come in contact with caustic spray materials are stainless steel, brass or plated.
9. Less chemical material is needed per tree.
10. Practically no run-off.
11. Greater Penetration.
12. This machine is completely universal—growers can use concentrate liquids, dusts, or both. The equipment can be used in vegetable work, field crops, weed and brush control, and with the simple change of air nozzles, for orchard work.



All growers who wish to increase their profits in 1953 should have the facts on the Buffalo Turbine. If you will write us today, we will be glad to send you full particulars.

BUFFALO TURBINE
AGRICULTURAL EQUIPMENT
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